INVASIVE SPECIES SCIENCE TEAM MEETING
JULY 9-10, FORT COLLINS, COLORADO

Wednesday morning, July 9, 2003

Introductions

John Schnase's overview

Parallel Kriging and ESTO presentation - Jeff Pedelty

Jeff Morisette's presentation: MODIS Time Series

John Schnase's wrap-up for NASA

Tom Stohlgren's presentation:
Mixing physics with biology
OR
Mixing people who stay clean with those who get dirty

- Presented Invasive Species before Gail Norton and Senior Executive Service 5/8/03 "Water 2025"
- Mention of a "Invasive Species 2025"
- Invasive Species and Invasive Species Information were the only two programs to receive increased funding from USGS this year
- Buckskin Gulch – burn area from Grand Staircase Escalante National Monument (GSENM) - how to track through the albedo change, climate, carbon storage with cheatgrass invasion at Buckskin Gulch
- When will early green-up years occur to have crews out to selected sites to seed native plants that could take and grow, native grasses to replace cheatgrass Tamarisk in Hackberry Canyon, GSENM
- Differentiate between sites that have been heavily invaded and those that have reached their potential
- Tamarisk is much more predictable than cheatgrass
- Investigating ways of using remote sensing
- SQL-server power, hand-held Palms in the field
- Data Survey – species list miss noxious species, even in Boulder County
- Predicted spatial map of exotic species @ GSENM
- Map exceptions but don't lose sight of the generality
- MSU – impartial satellite to take a look at where are those invasive species

Tom Stohlgren mentioned that he was one of 3, 15 min. science talks at a Dept. of Interior retreat. Gale Norton was present along with over 300 other major players. Invasive species has VERY high visibility across agencies and receiving budget increases in all the agencies.

Ed Sheffner's presentation:

This project is at a fine point for gushing
Great interest amongst agencies to show collaborative and cooperative work at the insistence of OMB

BLM, NPS would be user organizations of this project

MSU notes a willingness to work with CSU

Break for Lunch

Afternoon Session July 9

Tom Stohlgren notes that Robin Reich wrote the spatial statistics library for the university

Discussion: The Big Problem: Cheat Grass, Tamarisk, -30 to 5+ year trend

Relative merits of an autoecological approach – what it takes to bring all the detailed data and information for a species together on a national scale

Jeff Morisette: We should address the authorship of papers, who will write what needs to be addressed, publication strategy as a framing approach

Tom Stohlgren: (We should work to) pull off the big problem for a state instead of the whole country, easier to get results by defining an area, for example Colorado, doing cheatgrass within a year. Validation at large extents too big of a challenge in the short term. How big is the right size? Tractability depends on sampling/data availability.

Ed Sheffner: Target set by people who can use the information to make decisions that affect their local area. Providing at the National Park scale. Perhaps work at multiple targets for the year.

Tom Stohlgren: Tamarisk is the problem that is screaming the most, chronic wasting disease is another (data not shared by State of Colorado, publication of such data would be bad for hunting revenues)

Ed Sheffner: The Western Governor's Association is hot about cheatgrass, Idaho is pushing for this due to the increased fire risk.

Tom Stohlgren: Saltcedar may be a better candidate, as there are more readily available ways to fight it. It is on USDA's list.

Lori Bruce: Developing a map allows folks to develop a strategy for how to deal with tamarisk.

John Madsen: Cheatgrass is a more diffused issue without the Federal Government having a way to deal with it financially and practically.

Lori Bruce: Is it possible to help fire control by mapping cheatgrass.

Tom Stohlgren: Yes, BLM has done this. They map areas of cheatgrass, map it locally. If you "thin" areas, cheatgrass grows in creating more of a fire hazard itself.

Robin Reich: Mapping tamarisk in California.

Tom Stohlgren: Tamarisk mapped to remote sensing data, plot data. Tamarisk data is very accessible to Colorado.

Jeff Morisette: NASA contributes by mapping Tamarisk, to then say "that method works to save water…. we can map where the tamarisk is to 90%…. use hyperspectral data, etc. Use data sets for both species in the same area, MODIS time series, etc.

Tom Stohlgren: Catherine is working with Weed Management in Colorado. Eric Lane is the state coordinator.

Ed Sheffner: There is a program called "Develop" which NASA is sponsoring which is lower level college students collecting data, might be a matter of going county to county to collect data. Another program, GLOBE, is working with very young students, and might be available, they collect ground data under the overall direction of a scientist who directs the collection, they are outfitted with GPS tools.

John Schnase: What invasive species would yield the largest map?

Tom Stohlgren: It might be cheatgrass in terms of presence with tamarisk a close second, although tamarisk might be number one in urgency. California might be a close second to Colorado in amount of riparian data they've collected. More players and more attorneys are involved in California.

Tom Stohlgren: Grand Junction, CO. study is being done this summer for tamarisk. Tamarisk is a lot more predictable than cheatgrass. It looks for wet soil with high ph.

Robin Reich: California using hyperspectral data, Western Colorado using Landsat for tamarisk, also related to climatic patters to how fast it is spreading, more moisture in river bottoms that are intermittent, seeds spread faster in years with more precipitation. BLM is working the California/Nevada border (Mojave Desert) although they do not like to share their data.

John Madsen: You can develop a threshold at which you can detect it, (climate, water, precipitation), project a probability fringe around where you can detect.

Jeff Morisette: Soils maps are doable.

Ed Sheffner: Tamarisk is a major issue for USDA in California, ARS in California. I have funding set aside for NASA/USDA to work on this. USDA would be very interested.

John Schnase: In terms of data, computation, partnerships, contacts, what could come out could be equations, algorithms, that could eventually help other states.

Jeff Morisette: Establish a relationship in Colorado, there might be a crop in California that looks the same.

Tom Stohlgren: I know we can get (Colorado and California) to share data.

Ed Sheffner: Why not base this on watersheds instead of states? County level data is not sufficient.

Tom Stohlgren: We've thought of rivers, streams, reaches.

Jeff Morisette: Define large watersheds within the two states?

Ed Sheffner: Ultimately, the Colorado River watershed, and a few more. We wouldn't take the Colorado River all at once to start up with, rather start with reaches and work up to it. Start where you have data.

John Schnase: Data is often collected at the state level.

Tom Stohlgren: You just have data at a few quarter quads.

John Madsen: A lot of federal agencies data is based on watersheds not state boundaries.

Robin Reich: Compare presence of species with absence of species.

Tom Stohlgren: Most classification schemes suffer upon a few dominant species.

John Madsen: National Wetlands has maps of wetlands through the whole country, well, it took them 30 years,

Ed Sheffner: I can't speak for USDA, it's worth talking to them about. We have a lot to offer them in the work we've already done. They have a lot to offer in that they collect a lot of data.

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John Madsen's Presentation:
The GeoResources Institute at MSU – To develop tools that enable a better understanding
"I was working on invasives before invasives were cool"

Robin Reich mentioned STARMAP, a program involving CSU and the EPA to develop approaches for spatio-temporal design and modeling in order to further our understanding of aquatic resources.

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Lori Bruce's Presentation: Cross-Cutting Data Analysis Techniques

Jeff Morisette: Mother wavelets and the temporal stuff is really interesting

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Notes on the REASoN can:
Fold NBII into an ECHO framework
S/W Engineering Plan
Build "ECHO Lite" at USGS
Make NBII an ISDS partner
Build an ISFS system client
Build an ISDS Public client
Deploy into operational use
Working with NASA's Strategy for the Evolution of Earth Data Systems (SEEDS)

Break for dinner:
Many Thanks to Tom and Cindy Stohlgren for a most excellent barbecue

Thursday morning July 10, 2003:

Ed Sheffner: In reference to the National Invasive Species Council, NASA's participation should be more explicit

Tom Stohlgren: National Invasive Species Council principals for Ed to meet with include Gordon Brown, Invasive Species Coordinator, Department of the Interior; Lori Williams, Executive Director, Invasive Species Coordinator, Department of the Interior

The "Big Problem" Follow on Discussion

- SSAI support requested for RS data acquisition of EOS-1 and Aster data in particular. Jeff M. will handle MODIS data.
- Lori Bruce volunteers to help with the parallel computing assessment and development.
- Rob Baker volunteers to help with outreach, PR.
- Gaussem Asrar should be added to the list of attendees to a formal USGS meeting including Groat et al. in a meeting this fall.
- Middle of Nov. there is a weed conference in Ft. Lauderdale. Invasive species has an hour there to present and may be a good time to present the white paper.
- Add Stohlgren and Davern and Arvik to the RS data acquisition as ecology domain experts.
- Paper Ideas
    - Nature – MODIS time series paper (Morisette, Stohlgren, Schnase)
    - JISS Architecture papers. Probably two papers. Issues in Science and Technology paper on the ISFS. (Schnase, Stohlgren)
    - Remote sensing paper using Jeff's fig. on the scaling of speed up of computing to put published possibly in Remote Sensing. IEEE TGARS Letters, Transactions on Geosciences and Remote Sensing Letters. (Pedelty)
    - Scaling biological invasions paper (Tom) Possibly two papers
- Chris Dionigi is the contact person for NISC. He runs the task groups.
- 22-29 Sept as a possible week to go to the field to sample Tamarisk. The fieldwork could be filmed for inclusion in the Web site.
- Final candidates: Tamarisk in parts of the Colorado River watershed and Canada Thistle in Colorado (Canada thistle instead of cheatgrass was chosen in email discussions in the days following the Colorado meeting).
- MSU resources, skills, existing programs and expertise,
    - Verification and validation expertise (How good do the results need to be for the customer/user.)
    - Vegetation control measures (Chemical, natural control and prevention)
    - Habitat management
    - Aquatic invasive species
    - PR (Awareness and measure the value)
    - Geolibraries. How to access large amounts of Geo data, access the products and deliver to a decision support system. Web crawling to discovering datasets (Application development)
    - Market place interface.
- REASoN
    - Milestones and deliverables will be available 'soon' (end of Aug). – Ed.
    - Rob Baker mentioned that SSAI has a working ECHO client and would like to arrange a demonstration for the team
    - John Schnase to plan meeting of major participants for later this fall.